

# PATENT ABSTRACTS OF JAPAN

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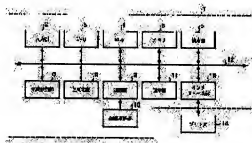
(21)Application number : 10-024887 (71)Applicant : CANON INC  
(22)Date of filing : 05.02.1998 (72)Inventor : NAKATSUKA TADANORI

## (54) DEVICE AND METHOD FOR IMAGE RETRIEVAL AND COMPUTER-READABLE MEMORY

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a device and method for image retrieval which can retrieve desired image data fast with high precision and the computer-readable memory.

**SOLUTION:** A character string as a retrieval condition is inputted from an input part 2. An area division part 7 divides the image data into areas by attributes and a color decision part 8 decides the color of an area having a specific attribute among the divided areas. According to the decided color, a recognition part 9 performs character recognition in the area having the specific attribute. Then a retrieval part 6 compares the recognized character string with the inputted character string and outputs image data meeting the retrieval condition to a display part 11 according to the comparison result.



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## CLAIMS

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[Claim(s)]

[Claim 1] An input means to be image retrieval equipment with which desired image data is searched, and to input the character string made into retrieval conditions from the database which manages image data, A color judging means to judge the color of the field which has a predetermined attribute among the fields divided with a division means to divide said image data into the field for every attribute, and said division means, A character recognition means to perform character recognition to the field which has said predetermined attribute based on the color judged by said color judging means, Image retrieval equipment characterized by having a comparison means to compare the character string inputted with said input means with the character string recognized by said character recognition means, and an output means to output the image data applicable to said retrieval conditions based on the comparison result of said comparison means.

[Claim 2] The field which has said predetermined attribute is image retrieval equipment according to claim 1 characterized by being a text area.

[Claim 3] Said character recognition means is image retrieval equipment according to claim 1 characterized by performing character recognition to the field which has predetermined attributes other than a specific color.

[Claim 4] Said character recognition means is image retrieval equipment according to claim 1 characterized by performing character recognition to the field which has the predetermined attribute of a specific color.

[Claim 5] The character string made into said retrieval conditions is image retrieval equipment according to claim 1 characterized by corresponding to the character string of the specific color contained in each image data managed in said database.

[Claim 6] Said output means is image retrieval equipment according to claim 5 characterized by displaying the field which contains the character string which has said specific color from the image data applicable to said retrieval conditions.

[Claim 7] The character string made into said retrieval conditions is image retrieval equipment according to claim 1 characterized by corresponding to the character string stained in the specific color contained in each image data managed in said database.

[Claim 8] The input process which is the image search method which searches desired image data, and inputs the character string made into retrieval conditions from the database which manages image data, The color judging process of judging the color of the field which has a predetermined attribute among the fields divided at the division process which divides said image data into the field for every attribute, and said division process, The character recognition process which performs character recognition to the field which has said predetermined attribute based on the color judged according to said color judging process, The image search method characterized by having the comparison process which compares the character string inputted at said input process with the character string recognized according to said character recognition process, and the output process which outputs the image data applicable to said retrieval conditions based on the comparison result of said comparison process.

[Claim 9] The field which has said predetermined attribute is an image search method according to claim 8 characterized by being a text area.

[Claim 10] Said character recognition process is an image search method according to claim 8 characterized by performing character recognition to the field which has predetermined attributes other than a specific color.

[Claim 11] Said character recognition process is an image search method according to claim 8 characterized by performing character recognition to the field which has the predetermined attribute of a specific color.

[Claim 12] The character string made into said retrieval conditions is an image search method according to claim 8 characterized by corresponding to the character string of the specific color

contained in each image data managed in said database.

[Claim 13] Said output process is an image search method according to claim 12 characterized by displaying the field which contains the character string which has said specific color from the image data applicable to said retrieval conditions.

[Claim 14] The character string made into said retrieval conditions is an image search method according to claim 8 characterized by corresponding to the character string stained in the specific color contained in each image data managed in said database.

[Claim 15] The program code of an input process which is the computer-readable memory in which the program code of the image retrieval which searches desired image data was stored from the database which manages image data, and inputs the character string made into retrieval conditions, The program code of the division process which divides said image data into the field for every attribute, The program code of the color judging process of judging the color of the field which has a predetermined attribute among the fields divided at said division process, The program code of the character recognition process which performs character recognition to the field which has said predetermined attribute based on the color judged according to said color judging process, The program code of the comparison process which compares the character string inputted at said input process with the character string recognized according to said character recognition process, Computer-readable memory characterized by having the program code of the output process which outputs the image data applicable to said retrieval conditions based on the comparison result of said comparison process.

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[Translation done.]

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image retrieval equipment with which desired image data is searched from the database which manages image data and its approach, and computer-readable memory.

[Description of the Prior Art] Conventionally, carry out the reduced display of each image data managed by the database to a display, and a user is made to choose desired image data from the inside, or the keyword etc. is given for every image data, and desired image data was searched with the image retrieval equipment with which desired image data is searched from the database which manages image data using the keyword.

[0002]

[Problem(s) to be Solved by the Invention] However, it was difficult to give a keyword suitable at the time of registration of image data by the approach of being unable to perform automation of retrieval and searching image data with the approach of searching desired image data in the above-mentioned conventional image retrieval equipment from the image data by which the reduced display was carried out, using a keyword, and when it was retrieval, even if it used and searched the keyword, it was difficult [ it ] to search desired image data exactly.

[0003] This invention is made in view of the above-mentioned trouble, and it aims at offering the image retrieval equipment with which desired image data can be searched with a precision sufficient at a high speed and its approach, and computer-readable memory.

[0004]

[Means for Solving the Problem] The image retrieval equipment by this invention for attaining the above-mentioned purpose is equipped with the following configurations. Namely, an input means to be image retrieval equipment with which desired image data is searched, and to input the character string made into retrieval conditions from the database which manages image data, A color judging means to judge the color of the field which has a predetermined attribute among the fields divided with a division means to divide said image data into the field for every attribute, and said division means, A character recognition means to perform character recognition to the field which has said predetermined attribute based on the color judged by said color judging means, It has a comparison means to compare the character string inputted with said input means with the character string recognized by said character recognition means, and an output means to output the image data applicable to said retrieval conditions based on the comparison result of said comparison means.

[0005] Moreover, the field which has said predetermined attribute is a text area preferably.

[0006] Moreover, said character recognition means performs character recognition preferably to the field which has predetermined attributes other than a specific color.

[0007] Moreover, said character recognition means performs character recognition preferably to the field which has the predetermined attribute of a specific color.

[0008] Moreover, the character string made into said retrieval conditions corresponds to the character string of the specific color contained in each image data managed in said database preferably.

[0009] Moreover, said output means displays preferably the field containing the character string which has said specific color from the image data applicable to said retrieval conditions.

[0010] Moreover, the character string made into said retrieval conditions corresponds to the character string stained in the specific color contained in each image data managed in said database preferably.

[0011] The image search method by this invention for attaining the above-mentioned purpose is equipped with the following configurations. Namely, the input process which is the image search method which searches desired image data, and inputs the character string made into retrieval conditions from the database which manages image data, The color judging process of judging the color of the field which has a predetermined attribute among the fields divided at the division process which divides said image data into the field for every attribute, and said division process, The character recognition process which performs character recognition to the field which has said predetermined attribute based on the color judged according to said color judging process, It has the comparison process which compares the character string inputted at said input process with the character string recognized according to said character recognition process, and the output process which outputs the image data applicable to said retrieval conditions based on the comparison result of said comparison process.

[0012] The computer-readable memory by this invention for attaining the above-mentioned purpose is equipped with the following configurations. Namely, the program code of an input process which is the computer-readable memory in which the program code of the image retrieval which searches desired image data was stored from the database which manages image data, and inputs the character string made into retrieval conditions, The program code of the division process which divides said image data into the field for every attribute, The program code of the color judging process of judging the color of the field which has a predetermined attribute among the fields divided at said division process, The program code of the character recognition process which performs character recognition to the field which has said predetermined attribute based on the color judged according to said color judging process, It has the program code of the comparison process which compares the character string inputted at said input process with the character string recognized according to said character recognition process, and the program code of the output process which outputs the image data applicable to said retrieval conditions based on the comparison result of said comparison process.

[0013]

[Embodiment of the Invention] Hereafter, the suitable operation gestalt of this invention is

explained to a detail with reference to a drawing.

[0014] <Explanation [ of image retrieval equipment ] ( drawing 1 )> drawing 1 is the block diagram showing the outline configuration of the image retrieval equipment of the operation gestalt of this invention. In drawing 1 , 1 shows the image retrieval equipment of this invention. 2 inputs the image data which is the input section which inputs image data, for example, was stored in the hard disk etc. Moreover, the alphabetic character for retrieval which makes retrieval conditions the text of the specific color contained in image data is inputted. 3 is a central processing unit for data processing (henceforth CPU) which controls the image retrieval equipment 1 whole. 4 is ROM and stores the control program and the various data which perform the flow chart shown in drawing 3 of CPU3. 5 is memory (RAM), and it memorizes the location of the field which memorizes the image data inputted from the input section 2, and the field distinguished in the field division section 7, the field which memorizes magnitude, and the color information judged in the color judging section 8 while being used as a work area of CPU3. 6 is the retrieval section and searches image data from the character recognition result of the text of a specific color based on the inputted alphabetic character for retrieval.

[0015] 7 is the field division section, divides and takes out fields, such as a text in the image data memorized by memory 5, a table, drawing, and a picture, and memorizes a location and magnitude in memory 5. 8 is the color judging section and judges the color of the text contained in image data. 9 is the recognition section and performs alphabetic character \*\*\*\* of the text contained in image data using the dictionary 10 for recognition. 11 is a display and displays the field in the searched image data and image data. 12 is a system bus and connects various components mutually including the data bus, address bus, and control signal bus from CPU3. 13 shows the interface section which performs an external output unit, for example, interface control with printer 14 grade.

<Explanation [ of an image window ] ( drawing 2 )> drawing 2 is drawing showing an example of the image window which shows the attribute of the image searched with the image retrieval equipment of the operation gestalt of this invention, and a field.

[0016] In drawing 2 , 21 is an image window which shows the image data searched with the retrieval section 6 displayed on a display 11. 22 is the field judged among the field division results by the field division section 7 to be a text. 23 shows the character string "character recognition" displayed in red.

[0017] <Explanation of operation gestalt> drawing 3 is a flow chart which shows the processing performed with the image retrieval equipment of the operation gestalt of this invention.

[0018] In addition, the control program which performs this processing is memorized by ROM4.

[0019] First, at step S31, the image data for retrieval is read in a hard disk etc., and is inputted, and it memorizes in memory 5. Moreover, the alphabetic character for retrieval for searching

desired image data is inputted from the input section 2. Next, ejection of the text used as a key is performed from each image data at step S32. First, what is necessary is just to be able to take out a text area at worst here, although a text, drawing, a table, a picture, a ruled line, etc. are taken out by field division by the field division section 7. Although which approach is sufficient as the approach of field division, the field division approach indicated by JP,6-096275,A is used, for example. Moreover, the color of the taken-out text is judged by the color judging section 8, and the text which has a color corresponding to the alphabetic character for retrieval specified by a user is taken out.

[0020] Next, character recognition of the text taken out at step S32 is performed at step S33. Next, it judges whether at step S34, the alphabetic character for retrieval which the user specified as the character recognition result obtained at step S33 is compared, and the same alphabetic character is contained by the retrieval section 6. If the same alphabetic character is contained, the image data will judge it as the image data for [ of a user ] retrieval, and will memorize a retrieval result in memory 5.

[0021] Next, it judges whether the above-mentioned step S31 to the step S34 was processed to all the image data for retrieval at step S35. When the above-mentioned step S31 to the step S34 is being processed to no image data (it is NO at step S35), return, the above-mentioned step S31 - step S34 are still processed to step S31. On the other hand, when the above-mentioned step S31 to the step S34 is being processed to all image data (it is YES at step S35), it progresses to step S36 and a retrieval result is displayed.

[0022] performing retrieval which made retrieval conditions the alphabetic character which has a specific color according to this operation gestalt, even when there is much image data for retrieval as explained above -- a high speed -- a probability -- automatic retrieval can be performed highly. Therefore, the image retrieval equipment which improves the operability of image data retrieval that it is easy to use for a user is realizable.

[0023] Although the alphabetic character which has a specific color was made into retrieval conditions in step S32 of drawing 3 with the above-mentioned operation gestalt, you may make it a configuration which makes retrieval conditions the alphabetic character colored with the marker etc. like 41 of drawing 4 . Also in such a configuration, the same operation and effectiveness as the above-mentioned operation gestalt can be acquired.

[0024] In addition, even if it applies this invention to the system which consists of two or more devices (for example, a host computer, an interface device, a reader, a printer, etc.), it may be applied to the equipments (for example, a copying machine, facsimile apparatus, etc.) which consist of one device.

[0025] Moreover, it cannot be overemphasized by the purpose of this invention supplying the storage which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and carrying out read-out



activation of the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage that it is attained.

[0026] In this case, the function of the operation gestalt which the program code itself read from the storage mentioned above will be realized, and the storage which memorized that program code will constitute this invention.

[0027] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, etc. can be used, for example.

[0028] Moreover, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that OS (operating system) which is working on a computer is actual, based on directions of the program code, and the function of the operation gestalt mentioned above by performing the program code which the computer read is not only realized, but was mentioned above by the processing is realized.

[0029] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the functional add-in board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[0030]

[Effect of the Invention] As explained above, according to this invention, the image retrieval equipment with which desired image data can be searched with a precision sufficient at a high speed and its approach, and computer-readable memory can be offered.

[0031]

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the outline configuration of the image retrieval equipment of the operation gestalt of this invention.

[Drawing 2] It is drawing showing the example of a display of the display in the image retrieval equipment of the operation gestalt of this invention.

[Drawing 3] It is the flow chart which shows the processing performed with the image retrieval equipment of the operation gestalt of this invention.

[Drawing 4] It is drawing showing other examples of a display of the display in the image retrieval equipment of the operation gestalt of this invention.

### [Description of Notations]

1 Image Retrieval Equipment

2 Input Section

3 CPU

4 ROM

5 Memory

6 Retrieval Section

7 Field Division Section

8 Color Judging Section

9 Recognition Section

10 Dictionary for Recognition

11 Display

12 System Bus

13 Interface Section

14 Printer

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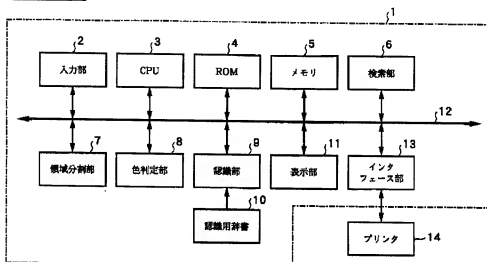
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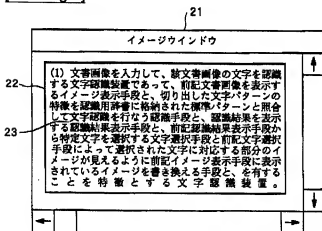
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## DRAWINGS

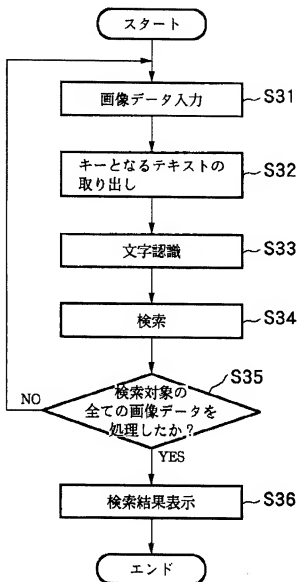
[Drawing 1]



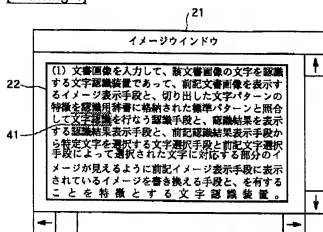
[Drawing 2]



[Drawing 3]



[Drawing 4]



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[Translation done.]